

Nuclear energy: Why it is different, and what that difference demands of us

BY JOHN J. GROSSENBACHER

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IN AN APRIL 23, 2010, *Washington Post* op-ed piece titled “Energy sector poised for innovation—with the right spark,” Bill Gates (chairman of Microsoft Corporation)

and Chad Holliday (chairman of Bank of America and former chairman and chief executive officer of DuPont) called for “a vigorous strategy to invent our future and ensure its safety and prosperity. In the realm of energy, as with medicine and national defense, that requires a public commitment.” The authors opine that the U.S. private sector cannot do this alone for several reasons, which I’ll second here.

First, Mr. Gates and Mr. Holliday note that there are profound public interests in having more energy options, with national security, economic health, and the environment at issue. These are not primary motivations for private sector investments, they say, but merit public commitment. I would add that without public commitment anchored in a coherent and consistent energy policy, there is little incentive for the private sector energy industry to change its energy investment practices.

Second, the authors argue that “the nature of the energy business requires a public commitment.” Developing new energy infrastructure such as electricity generating plants can cost billions of dollars and carry a significant risk of failure that does not always meet a risk-reward calculus that makes business sense. In my opinion, the up-front risk for new energy infrastructure typically is not aligned with accepted business investment practices in the United States.

Finally, the op-ed piece notes that power plants operate for 50 years or more and are cheap to run once built—which means that there is little market for new models. I’d add that life extension and upgrades of existing infrastructure are more attractive private sector investments than new infrastructure.

In short, I agree with the overall thrust of the article by Mr. Gates and Mr. Holliday. A national energy strategy and public commitment are essential to the future energy security and prosperity of the United States. An important element of that policy will be the

role of nuclear energy. I offer the following points specific to developing and building new nuclear energy capacity and managing the supporting infrastructure.

■ Nuclear reactor technologies are complex and expensive. Exceptional operational reliability and performance over a plant’s lifetime are essential for a number of very important reasons, and they are paramount to realizing an acceptable return on private-sector investment. In my view, improvement in energy security

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■ The behavior of reactor fuels and materials is the greatest uncertainty in new and innovative reactor designs, and these uncertainties are expensive and time-consuming to resolve. Sharing the development risk between government and industry is required as part of public policy to achieve an acceptable level of business risk so that the private sector can invest in these new and innovative designs.

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■ Long-term sustainable nuclear fuel cycles are essential to the anticipated use of nuclear energy for hundreds of years and perhaps longer. Increasingly, our nuclear fuel cycle choices are part of a global enterprise. Nuclear fuel cycle changes are expensive, involve significant infrastructure modifications, and take a long time to implement. One fuel cycle option could include industri-

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al-scale reprocessing technology, which is an expensive enterprise with significant hazards that must be managed extraordinarily well. Public policy should include the periodic investigation and selection of different fuel cycles that are respectful of realistic time frames, infrastructure demands, and costs.

■ Because of its hazards and its connection to nuclear weapons, nuclear energy is easily demonized by exaggeration and extrapolation. Knowledgeable people should neither exaggerate its benefits nor retreat from insisting on a responsible, factual, informed discussion of its burdens. It is important to communicate the difference between what is possible versus what is probable, that there is no such thing as zero risk, and that safety is relative.

We are at an important point in the development and use of nuclear energy for electricity generation—and, potentially, industri-

al process heat production—in the United States. This development and use requires coordinated government and private sector actions and collaborative partnerships to appropriately share development and implementation risks. The lack of a coherent national energy strategy and a complementary industrial strategy has led us to a point where there are considerable uncertainties regarding the energy infrastructure investment that should be made by the private sector. These uncertainties must be resolved in the mutual interest and must respect the reality of reasonable business risk. The inability to do so would be a failure of national governance.

Further, we have made policy and business decisions that have resulted in the United States no longer being the leader in developing, demonstrating, and deploying nuclear energy technology—with the result that the renaissance in nuclear energy will be led by foreign interests. We can accept the loss of this leadership role, cede it to others, and seek to lead in other technologies such as renewables, but because of the contributions of nuclear technology to national security, economic competitiveness, and our industrial infrastructure, I disagree with that choice. If we want to change direction, we must act now and embark on a concerted effort to reverse the course of these policies and business decisions. If we are to succeed, an enormous—perhaps unprecedented—effort involving serious, disciplined, factual public discourse will be required to inform both government and private-sector decision making.

This is a tall order. It will require, among other things, that those who have technical expertise in nuclear energy speak out effectively and responsibly. This means that they cannot join the scores of “expert” advocates who exaggerate the benefits and minimize the costs, and “expert” opponents who exaggerate the costs and minimize the benefits. We cannot delay in speaking out to provide a balanced, competent, clear voice to inform and influence the government and the private sector in the United States. The time to act is now. ■